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# Leveraging the physical network of stores in e-grocery order fulfilment for sustainable competitive advantage

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ABSTRACT

This work draws on the results obtained from a qualitative multi-case study carried out on a sample of retailers with a significant presence in the United Kingdom e-grocery market. Using the resource-based view model, the study determines whether operating an e-grocery channel, by leveraging the existing network of stores, yields a sustainable competitive advantage. The findings show that the network of stores is clearly the primary conduit through which e-grocery retailers offer a wide assortment of products, perishables and non-perishables, to a large geographically dispersed population, while meeting their high expectations of faster and on-time delivery. It offers e-grocery practitioners a different avenue of reflection in the exploration of the trade-offs between fulfilment responsiveness, last mile operation costs, and a seamless customer experience. The stores act, in e-grocery operations, as enablers of various other tangible or intangible benefits that translate into a sustainable competitive advantage. This is particularly important in the e-grocery market, where the physical space and handling requirements comprise significant costs that are difficult to recoup from delivery charges at levels acceptable to customers. Stores, as part of e-grocery retailing, maintain offline or pure online channels, and have implications in transportation and the overall value proposition of e-grocers.

## 1. Introduction

The growing importance of retailing has led several retailer groups to offer their products through multiple channels (Zhang et al., 2010). In the grocery retailing industry, due to the prevalence of digital technology and e-commerce, multiple companies have added an online channel to complement their traditional/offline in-store portfolio of offerings. These are known as multiple-channel retailers or 'bricks and clicks' retailers. Others have entered the grocery industry by offering their products online with an e-fulfilment option in-stores only, at dedicated sites only, or a combination of both in-stores and dedicated sites. These are known as pure online or 'clicks' retailers. The term e-grocers or e-grocery retailers was coined to refer to these companies (Hays, Keskinocak, & de López, 2005).

In recent years, some of these organisations have reported a significant increase in their e-grocery channel market share. For instance, in the United Kingdom (UK), in 2016, Ocado (a pure online trader) increased its market share from 12% to 14% (Retail Europe Report, 2017). Similarly, multichannel traders such as: Tesco's online grocery market share of 35% surpassed its offline share of 28.4%; Sainsbury's 15% online grocery market share trailed its offline market share by 1.8%; Asda/Walmart showed a difference of 5.2% between its online and offline grocery market share (Retail Europe Report, 2017; Statista, 2019).

Some of the biggest challenges e-grocery retailers face is that of order fulfilment and last mile delivery, especially while offering customers a seamless service experience (Agatz, Fleischmann, & Nunen, 2008; Hays et al., 2005; Hübner, Holzapfel, & Kuhn, 2016; Hübner, Kuhn, & Wollenburg, 2016). The issues e-grocery retailers have to deal with include where orders should be fulfilled (e.g., in-store, a warehouse, a dedicated fulfilment site), what logistics solutions should be adopted in the last mile delivery (e.g., customer pick-up vs attended or unattended delivery at home, workplace or at a dedicated drop zone), coping with the perishable nature of grocery items and their different handling requirements, the size of the shopping e-grocery basket, the range of product offerings (perishables, non-perishables, or a full service that includes both), the geographical market reach, the increasing importance of customers receiving their orders the same day and within a shorter order-to-delivery cycle, and the opportunities for synergies offered by the offline and online channels, or within a pure online

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channel (Hübner, Holzapfel, et al., 2016; Hübner, Kuhn, et al., 2016; Murphy, 2007; Zhang et al., 2010).

Unlike other non-food related industries, a significant number of e-grocery retailers still resort to their physical network of established stores to respond to the challenges arising from these issues, with significant alterations being made, whenever needed, to achieve the efficiency required by e-grocery operations (Hübner, Holzapfel, et al., 2016; Hübner, Kuhn, et al., 2016). There are numerous examples of e-grocery retailers that have opted for this approach. Walmart has 11 530 stores worldwide and leverages some of the stores to supply e-groceries to the United States, and also for its expansion to China, Mexico, Canada and the UK (Walmart, 2018). Target leverages its 1 822 stores and 41 distribution centres (DCs) to blend the digital and physical shopping experience (Target, 2017). Costco operates e-grocery business through its network of warehouses in the US, Canada, Mexico, the UK, Korea, and Taiwan (Costco, 2018). In the UK, the major retailers continue to stamp their authority on the e-grocery sector through their network of stores (Mkansi, 2013).

Similarly, some pure online retailers have started to expand their e-grocery market and offer their customers a full range of services, in addition to their traditional offerings that limit the selection to non-perishables products. In 2017, Amazon acquired Whole Foods Market grocery chain stores to complement its satellite de-bulking facilities in an effort to get groceries closer to consumers (Amazon, 2017). The Alibaba group acquired Auchan and RT Mart chains in China for its e-grocery offerings (Lu & Reardon, 2018). Casino Group signed an agreement with Ocado to strategically support its real estate (Monoprix stores) with Ocado's smart platform solution (OSP) for its Paris e-grocery market (Casino Group, 2017). Meanwhile, some other pure online traders have continued to do business without opening physical stores or collaborating with traditional retailers. The key differences between these two groups pertain, among others, to the range of products offered, as well as whether they cater to a smaller and selected category of customers or to a large population that is geographically dispersed (see the further discussion in section 2 of this paper).

Therefore, from the discussion above and unlike other retailing sectors, the network of stores remains the core strategy of e-grocers, regardless of their business model (pure plays, multiple channels or hybrid), that seek to offer a full and wide assortment of products, both perishables and non-perishables, to a large geographically dispersed population, while meeting the high expectations of faster and on-time delivery. Indeed, cutting-edge practice in e-grocery retailing is attributed to the use of store resources in balancing the trade-offs between fulfilment responsiveness and last mile operation costs (Hays et al., 2005; Murphy, 2007). In other words, the existence of an extended physical network of stores is perceived as a necessary condition but it is not sufficient to offer e-grocery operations with a full and wide assortment of products, both perishables and non-perishables, to a large geographically dispersed population.

There is very little work, if any, that provides empirical evidence related to whether operating an e-grocery channel, by leveraging the existing network of stores, yields a sustainable competitive advantage, and investigates how this could be achieved from a tangible resource-based view perspective. This study seeks to fulfil this gap. We resort to a multiple-case study research strategy to survey practitioners from UK grocery retailers that offer an online channel to their customers. We limit our study to the UK market because of our access to it, and its overall global importance. Indeed, as of 2015, the UK was second amongst the top five global online grocery markets (IGD, 2015; Mkansi, Eresia-Eke, & Emmanuel-Ebikake, 2018), but recently slipped into fourth place, behind the US and Japan (Institute of Grocery Distribution, 2017). A resource-based view (RBV) model is used to assert whether leveraging a network of stores in a new manner as tangible assets for online order fulfilment and delivery is a source of competitive advantage.

The remaining of the paper is as follows: Section 2 presents a brief e-grocery literature review, followed by a description of our methodology (section 3) and findings (section 4). A section discussing the implication for theory, practice, and transportation is then introduced (section 5), and the conclusion ends the paper.

## 2. Literature review and research questions

There are a few recent review papers on e-grocery supply management. Mkansi et al. (2018) present a table summarising almost fifty studies published from 2008 to 2017. The authors report that most papers have focused on three main areas: e-grocery fulfilment models, e-grocery shopping behaviour, and omni-channel or multi-channel perspectives. The authors have also found a limited number of papers on e-grocery technology application, ethics and responsibility, and theft and security. In their work, the authors discuss the main stages involved in e-grocery fulfilment, the challenges experienced in these various stages and the remedies reported by practitioners to overcome them. The challenges identified are mainly operational and pertain to three categories: supply vs demand, managing inventories, and managing roles and responsibilities.

After a systematic review of more than fifty papers, Melacini, Perotti, Rasini, and Tappia (2018) have compiled a report detailing the main issues faced by organisations in the retailing industry seeking to add online fulfilment and distribution to their existing offline channel mix. The issues were mapped in three categories: distribution network design to ensure a greater level of integration between the online and offline channels and flows; inventory and capacity management; and delivery planning and execution.

Another recent review of e-grocery research is that of Martín, Pagliara, and Román (2019). More than one hundred papers were evaluated through a bibliometric analysis to identify the main topics covered up to now, the trends, and the gaps that still exist in the literature. The paper reports that technological changes, innovation and diffusion, and environmental effects are the most e-grocery related research topics that have been studied in the literature. The paper also points out that online fulfilment has an impact on consumer behaviour, and the three related topics discussed in the literature pertain to inventory management, last mile delivery and the management of returns.

A common theme in each of the review papers reported above is the network of existing stores. However, none of them has pointed out the leveraging of this network of stores as a source of competitive advantage in e-grocery operations.

The two primary types of retailing traders discussed in the literature related to e-grocery practices are: pure play online (also coined as clicks, pure online grocery retailers) and multiple-channels (also called bricks-and-clicks, brick-and-mortar selling online). Various authors have discussed their relative strengths and weaknesses as well as the diversification that exists within each type which leads to different models.

Mkansi (2013) presents a comprehensive analysis of these retailing traders using the SWOT (the acronym for "strengths, weaknesses, opportunities and threats") and PESTLE (the acronym for political, economic, socio-cultural, technology, legal, and ecology) frameworks. It includes a discussion on their differences in terms of servicing a wider population, market-reach capabilities, turnover volume requirements, meeting higher expectations of on-time delivery, order picking efficiency, and environmental impacts.

Zhuang and Lederer (2008) discuss the differences between these retailing traders in terms of how they achieve their e-retailing benefits. An exploratory factor analysis was applied, which resulted in 27 benefit items being grouped in five meaningful factors, namely, market expansion, back-end efficiency, inventory management, cost reduction, and customer service. One of the key findings of Zhuang and Lederer (2008) study is that each type of traders should carefully select the product lines to emphasise, as they differ greatly in terms of where and how they realise their top benefits.

Kämäräinem and Punakivi (2002) discuss the diversification that

exists amongst these two business retailing traders in terms of e-fulfilment practices and order delivery options, the two significant cost-drivers in e-grocery operations. Their differences are discussed not only in terms of the costs involved, but also on terms of the product range and services offered, the customer base and customer loyalty requirements, the possibility of offering other value-added services (e.g., automatic replenishment of chosen products).

Hays et al. (2005) discuss a variation consisting of either a partnership/merger between a brick-and-mortar and a pure-play online or a brick-and-click retailer that opens up a dedicated e-fulfilment site in areas with higher demand. It is therefore a hybrid model that combines elements of both primarily types of retailing traders and seeks to maximise their strengths and minimise their weaknesses. In addition to the differences in the methods of order fulfilment and delivery, a distinct focus of Hays et al. (2005) work is on the differences in terms of the types of products offered (perishables, non-perishables, or both) and the geographical markets coverage. Several other scholars have discussed the strengths and weaknesses of the various e-grocery types of retailing traders and their various models (e.g., Hübner, Holzapfel, et al., 2016; Hübner, Kuhn, et al., 2016; Murphy, 2007).

A limitation of the works cited above is that they do not consider how these types of retailing traders and their various models differ in terms of pricing, a major element of the competitive strategies that determine whether or not to purchase online, along with other elements that are well documented in these papers, such as convenience, service, and product variety. Grein and Herrmann (2016) fill this gap in their work that focuses on the German online food market and a single product group (namely, chocolate bars). Using descriptive and inductive statistics, they empirically showed evidence that, even for a homogeneous product (such as chocolate bars), price levels are not identical across the e-grocery models, and in general, multichannel traders offer lower prices. Furthermore, there is a price dispersion within each of these e-grocery models.

Fedoseeva, Herrmann, and Nickolaus (2017) extend the study of Grein and Herrmann (2016) to a heterogeneous group of food and beverage products sold in the German grocery retailing market. As in Grein and Herrmann's (2016) work, the findings suggest that, in this e-grocery market, the prices of the multichannel traders are on average lower than those of pure-play traders, and the price dispersion remains high between and across e-grocery models, heterogeneous products and even absolutely homogeneous products. These studies suggest that e-grocery retailers can compete on the basis of a pricing strategy to differentiate themselves from one another.

Table 1 presents a summary of the e-grocery types of retailing traders, their variants and their evaluation in terms of various key logistics and service aspects. It shows that, for instance, Sainsbury's (UK) is a multiple-channel trader that uses an in-store e-fulfilment; offers a full service of both perishable and non-perishable products, with the options of home delivery and attended reception or in-store pick-up, to a wide geographical reach; needs a low to medium density of customers with specific attributes but a large turnover volume; is equipped to respond to a large and regularly ordered e-grocery basket size of many different items offered at mixed prices (including premium), and to be delivered within a tight time window (in few hours).

A pure play online can provide a similar offering, but with more expected premium priced items, solely through a hybrid model that includes both in-store and dedicated site e-fulfilment. Otherwise, a footprint of stores is required, as illustrated by firms such as Peopod US, Amazon with the acquisition of Whole Foods (Amazon, 2017), the prospective merger between Ocado and Marks & Spencer (Neate, 2019).

This summary table shows that the network of stores remains the cornerstone of e-grocery retailers, regardless of their business model (pure online, multichannel), if they seek to offer a full and wide assortment of products, perishables and non-perishables, to a

**Table 1**
Comparison of e-grocery models and their variants on various key aspects of logistics and services.

| Key aspects of logistics or service | | Type of e-grocery traders | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pure online traders | | | | Multichannel traders | | | |
| e-fulfilment site | | a central warehouse centre or a dedicated fulfilment centre | | | hybrid (in-store and dedicated site) | in-store | | hybrid (in-store and dedicated site) | |
| grocery products offered | | Perishables | semi or non-perishables | full service operations of both perishable and semi- or non-perishables | | | | | |
| preferred delivery mode | | HM-A | HM-A or HM-U DC-A or DC-U | HM-A or DC-A or IN-A | | HM-A or IN-A | | HM-A or DC-A or IN-A | |
| geographical/penetration reach | | narrow (local) | wide | narrow (local) | Wide | narrow (local) | wide | | |
| customer density | | high | low to medium | high | low to medium | High | low to medium | | |
| grocery order | cart or basket size (number of different items) | large with mixed priced items | small with premium-priced items | large with premium priced items | large with premium priced items | large with mixed priced items | | | |
| | Delivery window offered | hours to few days | few days to few weeks | hours to few days | | | | | |
| | frequency/items repeatedness | regular and same items | irregular and different items | regular and same items | | | | | |
| returnability convenience for customers | | Difficult | convenient | less convenient for perishables | convenient | | | | |
| turnover volume requirements | | small to medium | large to very large | | | small to medium | large to very large | | |
| Example(s) | | FreshDirect.com (US) MilkandMore.co.uk | Amazon, Netgrocery.com (US) | Thenaturalgrocery.co.uk Zulzi.com, Grocerease.co.za and Sisonke.Africa (South Africa) | Peopod USA, Amazon and Whole Foods, Ocado and Marks and Spencer | EthnicGrocer.com Mexgrocer.com Britishcornershop.co.uk | Sainsbury's (UK), | Tesco (UK)Asda (UK), Waitrose | |

HM-A = home delivery and attended reception; HM-U = home delivery and unattended reception; DC-A = central warehouse, dedicated centre or collection points pick-up and attended reception; DC-U = central warehouse, dedicated centre or collection points pick-up and unattended reception; IN-A = in-store pick-up and attended reception.

geographically dispersed population, while meeting high expectations of faster and on-time delivery.

None of the papers above reported on the strengths and weaknesses of the various e-grocery models, and none pointed to the leveraging of this network of stores as a source of competitive advantage in e-grocery operations. Our work seeks to fill this gap and aims to provide empirical evidence related to whether operating an e-grocery channel by leveraging the existing network of stores yields a sustainable competitive advantage and how this could be achieved. We resort to the resource-based view (RBV) which states that if a resource (tangible or intangible) or a capability is valuable, rare, inimitable, and there are organisational processes that enable the exploitation of said resource or capability, it could lead to a sustainable competitive advantage (SCA).

There have been rapid and significant technological advances since Wernerfelt's (1984) initial offering of the RBV. The broader RBV perspective is, however, limited in explaining how resources transform across different contexts in the digital era. Schriber and Löwstedt (2015) presented an exception in their study which explored tangible resources and the development of organisational capabilities. However, this work was not focused on the digital environment. A narrow search from the broader RBV research in the digital era reveals another skewed perspective towards digital resources that are intangible in nature and capabilities. In this regard, the majority of research appears to focus on Big Data and Analytics (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016; Mishra, Luo, Hazen, Hassini, & Foropon, 2018; Shan, Luo, Zhou, & Wei, 2018; Yu, Chavez, Jacobs, & Feng, 2018), cloud-based technologies (Mitra, O'Regan, & Sarpong, 2017; Son, Lee, Lee, & Chang, 2014), other information technologies (IT) and software innovation capabilities (Lioukas, Reuer, & Zollo, 2016; Park, Lee, Lee, & Koo, 2017), and DevOps and eco-capabilities (Minbashrazgah & Shabani, 2018; Wiedemann & Schulz, 2017).

While it is widely accepted that intangible resources may well comply with the RBV criteria for creating a sustainable competitive advantage, there is little research that examines how tangible resources can equally yield SCA, especially in emerging markets, such as the e-grocery retail sector. Our work seeks to contribute in that regard by seeking a deeper understanding of whether the leveraging of the network of stores, a tangible resource in the e-grocery sector, is a source of competitive advantage. Most importantly, we seek to determine how the role played by stores changes across different business contexts. In the e-grocery retail sector, the network of stores, a tangible resource, possesses an interesting theoretical perspective where a single resource (stores) within the same context of business operations (grocery retailing) creates different RBV perspectives for two different distribution channels (e.g. online and offline). Therefore, our research study seeks to answer the following research questions:

RQ1. How the leveraging of the network of stores in e-grocery operations enables value creation, if any?
RQ2. How the leveraging of the network of stores in e-grocery operations enables the creation of inimitability, immobility, and non-substitutability, if any?
RQ3. How the leveraging of the network of stores in e-grocery operations enables the creation of appropriability, if any?

The methodology applied in the research study is discussed in the next section.

## 3. Methodology

The research questions focus mainly on obtaining the evidence related to whether operating an e-grocery channel by leveraging the existing network of stores can yield a sustainable competitive advantage and how this could be achieved. A multiple-case study research strategy was considered appropriate for the study, as it allows the researchers to capture a view of the phenomenon under study in its natural context (Khotari, 2006; Saunders, Lewis, & Thornhill, 2012; Sekaran & Bougie, 2010) and without having to replicate it in an experimental setting (Rowley, 2002). This qualitative approach is widely described and endorsed by previous scholars (Saunders et al., 2012; Yin, 2015). In that regard, a sample of UK e-grocery retailers was selected for this study. We conducted semi-structured interviews with managers on the RBV criteria of value; barriers to duplication of inimitability, immobility and non-substitutability; and that of appropriability of store resources in their respective organisations so that their own implicit observations could be ascertained.

### 3.1. Participants' cases

The grocery retail structure in the UK comprises four categories, namely, Convenience, Forecourts, Supermarkets, and Traditional and Specialists; each subsequently divided into subcategories. These categories vary significantly in size and operate within any, or a combination of the business models of offline channel (stores only), online channel (pure play or clicks), or multiple channels (bricks-and-clicks). The participants in this study were sampled from the Supermarkets category with a focus on the Multiples subcategory, as it counts at least ten stores. There are about 24 grocery retailers in the Supermarkets and Multiples category. Within these retailers, we sampled four with a significant presence in the online market and that account for about 65% of the UK e-grocery retailers' market share.

Table 2 presents a summary of the market share and the number of stores of these e-grocery retailers. These four participants are the UK e-grocery market leaders. Furthermore, their e-grocery practices exceed ten years. Their significant presence and position in the grocery e-retail market offer a mature insight into value creation and sources of competitive advantage. The remaining 35% of market share includes not only pure players, but also multichannel operators from Supermarkets, Convenience, Forecourts, and Traditional and Specialists categories. Amongst these operators, the multichannel retailer Morrison's holds 5% of the market share and the pure player Ocado has 14% of the market share (Retail Europe Report, 2017). The remaining 16% is divided amongst other pure online and multiple channels, including those from the Traditional and Specialists grocery retail categories, such as Amazon.co.uk, Milk and More (milk and more.co.uk), Itadka.com, Red Rickshaw (redrickshaw.com – the UK's largest online Asian grocer), Spices of India, Mexgrocer.com (Mexican specialists), Natoora.co.uk, Thenaturalgrocery.co.uk, Britishcornershop.co.uk, and the Asian supermarket.co.uk. Some of these e-retailers are shown in the examples included in Table 1. They compete mostly in a niche market with a narrow geographical reach and have a range of products (perishables and/or non-perishables) sold at premium or mixed prices (Fedoseeva et al., 2017; Grein & Herrmann, 2016).

In order to serve a large population faster with full service operations of both perishables and non-perishables, some of these firms leverage their network of existing stores, such as pure traders Ocado (with Marks and Spencer) and Amazon (with Whole Foods), or multiple-channel trader Waitrose. Hence, our sampling allows for insights into the competition against other multichannel retailers within the Supermarket category, as well as the competition against other multiple channels and pure online grocery retailers from the other different categories in the UK grocery market structure.

The interviews were held with 15 national, tactical and operational managers that were sampled on the basis of their e-grocery roles and responsibilities. Strategic managers are responsible for supply and distribution strategies, planning, and resource allocation nationally, and therefore provide a deeper and more detailed view of the stores' role in the supply and distribution of groceries. Tactical managers are responsible for resource allocation at the regional level. Operational managers are at the core of supply and distribution and take part in strategic processes regionally, including the daily supply and distribution operations, from 'picking' (selecting for online customers) to delivery. This

**Table 2**
Summary of market share and number of stores.

| Multichannel grocery e-retailers | Grocery market share 2019 (Statista, 2019) | E-grocery market share 2016 (Retail Europe, 2017) | Number of stores resources 2010-2011 | Number of stores resources 2012-2013 | Number of stores resources 2017-2018 |
|---|---|---|---|---|---|
| Company A | 15.3% | 11% | 371 and 1 DCs | 541 stores, 200 serve online and 2 DCs; 6 vans and 78 staff average | 642 stores |
| Company B | 15.9% | 15% | 872 and 2 DCs | 1012 stores, 204 serve online and 0 DC; 7 vans and 56 staff average | 1 423, and 33 distribution centres, 102 stores serve same-day delivery to 40% population. |
| Company C | 27.7% | 35% | 2 482 and 1 DC | 2979 stores, 300 serve online and 4 DCs; 8 vans and 60 staff average | 3 433 – 3 435 |
| Company D | 5.1% | 4% | 223 and 2 DCs | 272 stores, 150 serve online and 1 DC; 52 vans and 150 staff average | 353 stores and 6 DCs |

Data sources for number of stores resources:
- 2010-2011: Mkansi (2013); Wallace (2012); John Lewis Partnership PLC, (2010)
- 2012-2013: Mkansi (2013)
- 2017-2018: Walmart (2018); John Lewis Partnership PLC (2018)

allows them to provide a state-of-the-art holistic view, and also means that they have the insight necessary to assess and explore stores with regards to how they meet the RBV criteria. The roles and responsibility profiles of strategic, tactical, and operational e-grocery managers' fit within the assessment of the general three managerial levels as offered by Bocij et al., 2015.

### 3.2. Sampling and interviews

The purposive sampling of the four grocery retailers meets the minimum requirement of four cases that are necessary in a multiple-case strategy (Stake, 2006) to provide the necessary insights to answer the main research questions. The strength of purposive sampling in providing valuable information has been acknowledged by previous scholars (Sekaran & Bougie, 2010; Yin, 2015).

The duration of the interviews with managers in the organisations varied between 45 min and 2 h, depending on the participants' responses and the expansion of follow-up questions. At the start of each interview, confidentiality and a working definition of a resource as per RBV were explained. The responses were recorded, with the consent of the managers, for the purpose of fully capturing the in-depth discussions. The participants were asked between 17 and 19 semi-structured questions about the value, barriers to duplication (inimitability, immobility and non-substitutability), and appropriability of store resources in their respective organisations. The semi-structured interview questions were derived from the consideration of the literature on RBV criteria, especially in terms of how a resource qualifies for SCA.

### 3.3. Data coding and analysis

The qualitative data that was collected was transcribed and coded using two approaches, namely, open and non-hierarchical axial coding. Open coding was used as a starting point to uncover and open up the transcripts, in order to expose the thoughts, ideas, meanings, and numerous concepts relevant to the subject under study. This particular approach is advised by Babbie (2013), who emphasises that open coding is used as a starting point and that a failure to open up the transcripts compromises the analysis and communication that follow the research. In this context, words and phrases found in the transcripts were used as the first stage of coding (e.g. access points, optimum assets, etc.).

In the second stage of coding, a non-hierarchical axial coding was used which relied on the results of the open coding. Axial coding is described by scholars (Babbie, 2013; Ezzy, 2002; Strauss, 1987) as the creation of themes or categories by grouping codes given to words or phrases. In this study, the outcome of open coding was grouped into the theoretical themes of value (benefits less costs); the barriers to duplication, namely, inimitability, immobility and non-substitutability; and appropriability. This coding aided in reflecting on meanings from the data and relations to the RBV criteria.

This was later analysed through content analysis, a qualitative technique for interpreting the meaning of text data using three distinct approaches, namely, conventional, direct and summative (Hsieh & Shannon, 2005). The approach considered for this study was conventional content analysis, which supported the chosen coding scheme, and allowed for the tracking and tracing of rich qualitative responses, instead of preconceived categories.

The trustworthiness and transferability of the study involved some of the approaches outlined by previous scholars (Polit & Beck, 2012; Yin, 2015) of providing a background description of the research context before the interview, outlining the methodology to the participants, and the preservation of transcripts. Hence, the audio record and transcripts of the e-grocery operators are some of the practice and evidence considered appropriate and relevant for convergence and support of the constructs discussed by Yin (2015) and Rossman and Rallis (2011). For credibility, also known as internal validity, the results were reviewed and confirmed by the national CEOs for fairness, completeness and validity of the data.

## 4. Findings

This section elaborates on the practitioners' views and the emphases they put forth in relation to how the network of stores creates RBV value; the barriers to duplication of inimitability, immobility and non-substitutability; and appropriability in the supply and distribution of e-grocery retailers in the UK market.

The prominence of store assets as inputs and outputs of e-retailing is described differently by the various practitioners, but the common thread appears to be more related to how they connect and interact with other facets of supply and distribution, from order delivery (transportation), inventory (order stock), communication (order processing), and unitisation and packaging (order picking). As such, the value, barriers to duplication, and appropriability described throughout this

section draw on some of the many exemplified heterogeneous tangible and intangible benefits gained by leveraging the network of stores in its interaction with the aforementioned logistics elements when dealing with e-grocery operations. According to the practitioners, the larger the network of stores (in number), the larger the perceived tangible and intangible benefits. Table 3 presents a summary of the key findings.

### *4.1. Store's ability to meet the criterion of RBV value in e-grocery fulfilment operations*

The managers described the store's importance variously as having a strategic or operational value. Drawing from their verbatim articulation, a strategic value is linked to high investment, long-term fixed assets, such as buildings, land, reputation, and trust, and are crucial for the e-grocery operation's generation of income. Whereas, an operational value is linked to what is derived from variable assets, such as inventory

**Table 3**
Summary of findings.

| RBV Findings | Use of stores Findings |
|---|---|
| Value:<br><br>Stores provide the online channel with a strategic and operational value that permeates every fundamental element of the supply and distribution models in e-grocery retailing, from order processing (inventory), picking (packaging), grocery Information systems (communication), stores (storage and facilities), to delivery (transportation). From the perspective of order delivery, they position e-grocery retailers in a better position to compete against one-hour delivery slots, within the balance of reduced delivery cost and enhanced customer service. | Stores are clearly considered as the veins through which e-grocery retailing is delivered and offer e-grocery practitioners a different avenue of reflection with regards to how to kill two birds with one stone. |
| Barriers:<br><br>*Inimitability:* stores create a barrier to inimitability that exists due to economic deterrents such as the pre-emptive large costs of investment and regulatory protection that deter competitors; resource position barriers arising from the first-mover advantage, and the defensible brand position necessary for customer retention.<br><br>*Immobility:* stores enable a wider geographical reach and ability to scale the growth of the online channel, which serve as impediments to imitation that drive resource immobility.<br><br>*Non-substitutable:* The effective and efficient coordination of departments create not only heterogeneity but also unique causal ambiguity and transactional barriers that make it hard for the e-grocery channel to reach a wider market independently of stores. | The study reveals how tangible resources change across channels in the digital age. The digital transformation of tangible resources provides interesting ideas in terms of resource orchestration, cross-fertilisation of knowledge, and cross-utilisation of human resources in a context where the physical space and handling requirements comprise significant costs that are difficult to recoup from delivery charges that are at levels acceptable to customers. |
| Appropriability<br><br>The findings highlight learning curves in terms of product development, managing availability and the ability to deal with an unpredictable environment as some of the appropriability that arises from the stores for the benefit of the e-grocery fulfilment channel. | The study highlights the fact that the same resources may not satisfy the RBV criteria for businesses in the same online channel, given the nature of e-commerce and products. The use of stores as part of e-grocery retailing, not only maintains an off-line multichannel for customers, but also has implications towards avoiding early obsolescence of stores' sites and city logistics in this increasing era of e-shopping and digitalisation |

(order stock), staff, order processing, and transportation of e-groceries.

#### 4.1.1. Strategic value-creation

The strategic role of the store is described as a core of optimum assets that are necessary for cost reduction and the supply and distribution of e-groceries. The description reveals that stores enable value-creation in terms of geographical penetration and set-up costs for the online channel. The verbatim statements of managers are:

**Optimum assets:** "Because it is part of our programme (clicks and bricks), so actually, we are using our estate as an absolute optimum asset in getting closer to customers. The options will develop as far as the estates. Currently, in certain areas of the country, an order is placed online and have it either delivered within the delivery window or collect from the store. So, we have greater options because of the estates, we have to do that compared to our rivals".

In the verbatim transcript above, the rivals are not only other multiple-channel retailers but also pure online traders that operate in the UK e-grocery market structure. Thereby, they foster two perspectives of competition: within the UK multiple-channel online grocery retailers and within the overall UK grocery online channel (multiple-channel and pure play retailers). A further observation is that of the emphasis placed by the practitioners on the reduction of set-up costs from the perspective of order delivery (transportation) and the support necessary for order processing in favour of the in-store model when compared to the use of a distribution centre model. The main point of departure is the stores' capabilities to bridge the distance travelled to fulfil online orders and the cross-pollination of staff. The larger the network of stores, and the lower the distance travelled, as well as the cost of delivery (or the cost for pick-up), the shorter is the response time. These, in return, contribute to create other intangible resources, such as customer trust and loyalty, company reputation and brand, and tacit knowledge on how to provide a seamless service to customers that use the online grocery service. Therefore, the stores' capabilities to bridge the distance and cross-pollination of staff help to propel the growth of the online channel for strategic value because they act as enablers of various other tangible or intangible benefits.

**Reduction of set-up costs:** "It reduces mileage, fuel and initial set up costs; those are the initial cost savings. In terms of home centres everything is just contained in that one unit, if they were to be short of people they cannot pool from the store people/resources which again reduces cost if operated in the store. There's quite a wide range of resources and support from the store".

Furthermore, managers view stores as access points that are necessary to give the e-grocery customers a consistent experience of both traditional and digital shopping. They are of the opinion that the dual offering is crucial for building on the existing relationships between digital customers and local stores. Stores contribute to the business's growth, build brand, and increase online loyalty when used as an e-fulfilment centre, as expressed below:

**Access points**: "stores are the first of all access point, customers access brand, and serve as a market place where you can showcase; create image, environment, and brand identity in order to ensure that customers are confident in purchasing their products from you".

**Customers' trust**: "*because customers trust us, we are transparent, localising the products" … "I think the advantages are that we are local, picking the same products for online as for offline customer and at the same offer" …. "the stores' reputation is transferred online. If the store has good reputation, it goes hand in hand with online. It's perceived to be good customers' service and good products*".

Moreover, managers suggest that it would be impossible to distribute e-groceries to a wider population without stores due to their proximity to residential areas which is important for quick deliveries. The stores also serve an important role in the management of stock availability due to the interdependence of roles that are in the hands of the offline branch managers as explained below:

**Shortens distance for deliveries:** "I think it gives us the distance between the store that is assembled at and the address that is delivered to be, far shorter because of our estates, in comparisons to our competitors".

**Dot.com impossible without the stores:** *"we wouldn't be able to run dot.com without the stores. For example, in case where we don't have products, they ring a supplier to request more products or tell them they are late"*.

These verbatim statements illustrate, as shown in the summary Table 1, that a network of stores remains the conduit for a fast distribution of e-groceries to a large geographically dispersed population. This holds for multiple-channel retailers and online traders that offer a full and wide assortment of perishable and non-perishable products.

#### 4.1.2. Operational value-creation

The operational perspectives emphasised by the managers highlight areas of cross-fertilisation and the better utilisation of human resources. In this regard, the e-grocery managers' appropriate operational value in terms of the replenishment of stock and the management of stock availability, which fall within the ambit of the store manager, yet which are most important for the e-grocery manager and the online channel, are expressed below:

**Centralised tasks:** (in-store manager): "we are just picking the goods and delivering it, whereas the rest is done by the store from replenishment of the stock, managing wines and spirits, fresh produce, and grocery managers who are quite central because they have to service the shop floor. The night staff have to replenish the stock for us. In terms of that, three-quarter of work is done central and we just pick and deliver".

Moreover, stores are repositories of capabilities for creating value for the e-grocery retailers. In particular, as the repository of specific product knowledge, which supplements the online channel. Examples of statements by the managers are:

**Expertise of knowledge-sharing:** "product knowledge, e.g. if a customer orders a seabass fish from the counter, and it was not available. The e-grocery shopper may not have product knowledge to pack a different alternative fish; hence a member of staff on the fish counter may have been able to advise on a similar product. For frozen food, e.g. for ingredients, the people on the department will have more product knowledge than the online pickers".

The managers continued to justify operational value in terms of different support levels that exist in the stores. The support ranges from the cross-utilisation of staff in cases of sudden demand changes, leave cover, sickness, reaction to customers' queries or complaints, and stock management.

**Support level (a):** "purely because of the support level around you. I am not sure of the logistics of cost in a central distribution or dedicated e-fulfilment centre because, we do have purely dot.com which works very well, but for me as a manager, to operate where I have support around me is very important."

**Support level (b):** in-store dot.com manager: "I think if we are shortfall of people or we have big spike in orders we can use colleagues in the store. We can also react to customer queries easily if they are not happy or have an issue; because we are local based. As a home shopping manager, I can visit them and take the items out myself, i.e. if it was a missing item or an issue, so that they see the face of home shopping manager - that is the benefit with being in the store."

The different and various emphases on the importance of stores for the e-grocery channel suggest that the store resources provide many heterogeneous tangible and intangible benefits which, taken together, uniquely create value for the e-grocery model. Although managers reported both strategic and operational value-creation, the store assets provide much more operational value to the online channel than to the offline channel. For example, the online channel does not have to deal with replenishment or management of the floor as the store does. As such, the offline channel serves as a huge subsidy for the online channel, but the opposite is not the same. Where both channels benefit from each

other is in terms of data mining. The online channel serves as a data warehouse, rich with information that could improve store offerings. However, from day-to-day activities, the offline channel lends more to the online channel.

### 4.2. Stores' in ecommerce creating inimitability, immobility, and non-substitutability

In accordance with the RBV criteria, key resources should be unable to be duplicated by rivals. This is true when the resource is inimitable, immobile and non-substitutable. If the competitive advantage gained from having stores is easily imitated, then it is not possible for stores to constitute a source of competitive advantage. In this context, how does e-grocery transform the qualities of stores in terms of barriers to duplication?

#### 4.2.1. Stores' resources in e-grocery creating inimitability

The stores create a barrier to inimitability that exists due to economic deterrents, such as the pre-emptive large costs of investment that deters competitors. The following quotes from the managers attest to the inimitable nature of stores for e-grocery fulfilment:

**Cost barrier (a):** "I think it is more about cost-setting structure; for example, Morrison's have recently launched similar online option. And because our infrastructure is well developed and well established, it's going to take some time, and significant investment for them to match us".

In the quest to explore threats arising from other practices to imitate stores (such as the utilisation of the postal service for the distribution of groceries envisaged by Migros in Switzerland), the executive responded:

**Cost barrier (b):** "I think it will do, but equally is about infrastructure, it will either take enormous investment or more to establish that industry; and the thing about the UK is that there's still lot of unpopulated areas where we cover, and it is very difficult for competitors to switch that through about whatever solutions they have. If we think of couriers or postal service that we have in the UK and their price model now, is significantly expensive today than it was six months ago and that is because of the density of the population. Our infrastructure is a backbone to our e-retailing. I don't think the use of postal service to distribute groceries will migrate to UK, because it's not a very full service. If it did, and customers responded positively to it, then we will have to review its response. My prediction is that it won't migrate to the UK and if it did, it won't be popular".

Further to probing questions about other specialists offering ambient products (e.g., Amazon) and/or the possibilities of courier companies or postal services experimenting with flexible delivery options that might favour a competitor's specialist practices, the executives opined:

"Any new entrant is evident of competition. But the important thing is how do customers respond and what happens to market share over the period of time. The very interesting thing is that our company looks at what competitors are able to offer customers. Especially how close they can provide a full home shopping service (e.g. selected from about 25 000 different products that is normally offered in a normal UK food store). Our company is allowing in having the widest range and widest coverage across the country of that offer. Therefore, customers have a clear choice, if they want to shop online if they are shopping for themselves then we are a very natural choice. But if they want to buy large quantities of one or two products then there are alternatives. Also look at not only the price of the products but the price of delivery charge as well".

"Well I think you have to look at what customers are doing in the UK. If you look at grocery home shopping most customers may order around different 50–60 products which include: wide range of grocery, meat, baked products, chilled products from dairy, delicacies and frozen food. That makes it quite a challenge to deliver; you need to have a delivery vehicle that can cope with frozen temperatures, normal temperatures and chilled temperature products. So I don't know of any service that the postal service provide or any other transport company that is able to delivery multiple temperature to very precise delivery windows, maybe just 1 h. I think it is probably very hard for them to take competitive advantage from us".

These verbatim statements emphasise the competition between multiple-channel retailers and pure online traders. They infer that, unless a hybrid model is adopted as shown in the summary in Table 1, pure online traders cannot imitate the stores' capabilities to offer a full and wide assortment of both perishable and non-perishable products to a large geographically dispersed population, while meeting the high expectations of faster and on-time delivery. Therefore, the network of stores remains the conduits for the fast distribution of such e-groceries. Pure online traders can still offer a wide assortment of nonperishables goods to a large geographically dispersed population, but the order size in this case will be comprised of a few different items (may be purchased in larger quantities), rather than the normal size of a regular grocery basket, sold at higher average prices (Fedosseva et al., 2017; Grein & Herrmann, 2016).

Whilst the large financial resources of competitor firms may somehow suggest the ability to buy or build a network of stores (e.g., the hybrid model of pure online traders shown in Table 1), which precedes the view of inimitability and immobility (a concept discussed in the next section) of tangible resources, the history and timing of the first movers create a resource position barrier. According to previous scholars (Millmore, Saunders, Lewis, Thornhill, & Morrow, 2007; Wernerfelt, 1984; Wright, McMahan, & McWilliams, 1993), competitive advantage is sustained by pioneers that master the utilisation of resources for superior performance for the duration of such a resource advantage. Moreover, the legislative grounds of building and acquiring such stores in the UK appear to be the gravity that cements the first movers' advantage, and inimitability (as well as immobility) of the stores' resources. According to Warwick District Council (2019), economic, social, and environmental factors are taken into consideration in their decision to grant permission for a development, which is guided by the National Planning Policy Framework 2018 and the Planning and Compulsory Purchase Act 2004. This creates first-mover advantage which is hard to imitate between the online grocery channel operators in the UK. Their geographical penetration is by itself an isolating mechanism or industry-level barrier-to-entry as described by English (2001).

Furthermore, regulatory protection also deters competitors. For instance, the regulatory barrier discourages disclosure of information when employees change jobs, as attested to by the following quote:

**Regulatory barrier**: "In senior managerial role, we do enforce a period of six months where you do not work for competitors within that period. And if that is breached, the company takes legal actions. Anything that is intellectual property, just as any company, if divulge, our company will take legal channels".

Nevertheless, in the case where cost and regulatory barriers can somehow be lifted, Wright et al. (1993) suggest that the competitors will have to duplicate the probable circumstances under which these store resources function. The access to a physical infrastructure of stores is a necessity, but this is not a sufficient condition for a competitive advantage for e-grocery retailers. The intangible resources (some were previously discussed) that result from the know-how/know-why when leveraging the network of stores, of themselves constitute other barriers. For instance, managers identified three similar reasons that make it hard for stores' resources to be duplicated, thus creating a resource inimitability. The managers emphasised differently brand and reputation barriers as:

**Brand barrier (a):** "it's what customers know, and they recognise the brand already. It is something they are familiar with, when they go online and order, they think of the shop as what they know, they take it as one."

**Brand barrier (b):** "The whole question is one of access to customers; customers want to have access to the brand, and therefore in order to have that much access we offer a wide store coverage. And that

is the most important part of being able to offer customers choice. We will always continue to make sure those customers have the very best choice. It also means that by using our store to do home shopping from, it means we can provide better service to nearly everyone that lives in the UK".

**Brand barrier (c):** "I think it's about product and reputation, which we are taking from the high street. Really great products and honestly priced, although people think we are a bit expensive, but on branded products we are as cheap as anywhere else and match other competitors. So there is something around people trusting the products, brand, and the integrity of our stores".

The quotes above imply that stores create barriers that make it difficult to package and sell, and therefore, difficult for competitors and new entrants to buy or enter the market. Although stores are visible, which suggest they can be imitated (as in the case of the pure online traders' hybrid model shown in the summary in Table 1), significant inimitability exists because the resources are firm-specific and transaction costs are high.

#### 4.2.2. *Stores' resources in e-grocery creating immobility*

In addition to value and inimitability, the firm will also have to sustain competitive advantage through the immobility of its resources. The findings from this study indicate that stores enable a wider geographical reach (as shown in the summary in Table 1) and the ability to scale the growth of an online channel, which serves as impediments to imitation that drive a resource immobility as described below:

**Growth and scale**: "Potentially, partially because customers see us working in the store, one of the benefits we have at the moment is that we deliver to 99% of the UK population. Only certain areas of Scotland, outer areas that we do not deliver; so virtually anybody within the country can order from us. We have the store everywhere already, which is then relative easy to introduce a dot.com even in small areas. Even if it's a dot.com that runs on two vans, the facilities and the option are there for customers. So because you have shops around the country, it's easier than the cost of building, stock in, and sending the distribution purely for the dot.com operation".

**Reach:** *"They are the backbone to reach more people. It may not be 150 in the future they might be fewer, but at the moment they are the backbone"*.

Overall, the manner in which stores support e-grocery distribution appears to reveal several silent barriers. The network of stores can be used to redeploy the human and information resources that are required to respond to an uncertain online channel demand. For example, in cases where personal shoppers are off sick, the dot.com manager has the advantage of being able to react to an emergency or unexpected online demand by pulling staff that are appointed mainly to serve the offline channel. In their articulation, the in-store online grocery operation relies heavily on the efficient and effective operation of other store departments, especially replenishment. The effective and efficient coordination of departments create not only heterogeneity but also histories that have the characteristics of causal ambiguity and social complexity. Thus, this constitutes a transactional barrier, because the output is the sum of many interacting dependent human resources. In this context, even though human resources are highly mobile, it can be argued that the value creation of a team is immobile. The advantage in the value creation remains with the e-grocery retailer, given that the team as a whole creates a highly inimitable barrier. The assertion of a team's sustainable competitive advantage is reinforced by findings from previous studies (Delery & Roumpi, 2017; Lo and Fu, 2016; Tokuda, 2005; Wright et al., 1993). The latter scholars argue that few resources are productive on their own; the majority require the cooperation and coordination of teams of resources. Delery and Roumpi (2017) highlight the contribution of human resources in shaping the supply side and demand side. Lo and Fu, 2016 provide a literature review of compelling evidence in relation to the correlation between team and firm performance in the IT industry. Tokuda's (2005) critical assessment of RBV suggests that a capability is the capacity for a team of resources to perform some activity which is regarded as more vital to competitive advantage than resource per se. Wright et al. (1993), in their study of human resources and SCA, reinforce the team advantage by asserting that it is possible to hire a team, but even a team's effectiveness may depend on their relationships with other teams.

Furthermore, from the perspective of the stores' interaction with order delivery (transportation), competitive 1-h slot delivery offerings appear to be another important silent barrier that creates immobility (and also inimitability). Whilst the e-grocery retailers in this study appear to be storming towards guaranteed 1-h delivery slots, in-store managers, in contrast to those at a central distribution or dedicated e-fulfillment centre (DC managers), focus on different issues and angles of the 1-h service. For example, the in-store managers worry over the impact of the 1-h slot on efficiency and costs, whereas DC managers' report that *"at the moment, until we build our trade levels up, it's not proving to be as cost-effective as it will be in the future."* The latter assertion serves as a good example that the concerns of a dot.com store manager are that of balancing the 1-h delivery slot for customer value, against the cost of delivery. The DC manager appears to be more embroiled in building trade, due to the high cost of maintaining and running a central distribution or dedicated e-fulfillment centre.

The in-store dot.com manager is usually responsible for the picking, technology, and delivery aspects of e-groceries. DC managers are based in the distribution centre and are responsible for overseeing all aspects of e-grocery order fulfilment, from inventory replenishment, technology, maintaining different types of storage, transportation, and picking of the products. Whilst the DC managers and dot.com store managers in this study are, or may be, part of a hybrid model, there are completely different sentiments and concerns in terms of managing the store than managing a central distribution or dedicated e-fulfillment centre. For example, the in-store dot.com managers' role excludes issues related to replenishment and issues of unavailability penalties are passed over to store managers who are responsible for re-stocking (Mkansi et al., 2018). This is not the same for DC managers. Further, there is the challenge of finite vans against the spatial dispersion of e-grocery customers that ought to be served within a 1-h slot, which is harder to achieve to a wider population from a central distribution or dedicated e-fulfillment centre, but easier to manage from in-store. As such, the stores appear to give in-store e-grocery fulfilment a competitive edge by offering such a 1-h delivery window to a wider population over a pure play online without a network of stores. Moreover, the different approaches employed by each of the e-grocery retailers in managing the costs and efficiency of the 1-h delivery slot equally remain a differentiating factor between the in-store model practitioners.

From an RBV perspective, it can be argued that when the demand for e-grocery is low, and the industry is static, it is assumed that e-grocery retailers with a high number of store resources would have a relative productivity advantage, due to the penetration of stores into a wider geographical population whilst maintaining the online service. And where the demand for e-grocery is high and the industry is dynamic and complex, the store resources may influence the effectiveness of e-grocery retailing through the increased capacity to adapt to online demand by enabling quick and efficient development, and the implementation of supply and distribution strategies to meet the demand.

The immobility of stores gives multichannel grocery retailers a sustainable advantage in terms of both static and dynamic market changes. For example, if the demand remains low and the industry doesn't change, multichannel retailers will still be able to maintain a consistent offering for both offline and online channels because they already have a huge penetration of stores and presence across the UK geographical area, without having to add extra resources. Hence, if the demand is low, and the industry is static, it will be hard for pure online players to sustain this business model, a sentiment which has been equally expressed by a DC manager above of *"mainly trying to build up the trade*". Hence, the relative advantage of having the chain of stores. The findings reinforce Basker et al. (2018) findings that chains of grocery stores were much

more resilient due to assortment and lower prices in tough periods. Also, if the demand is high and the industry is dynamic, the multichannel retailers with lots of stores will still be able to adapt to market changes and react to competitors, because they already have the store infrastructure that offers learning curves on how to cope with the two channels of grocery demand. The stores provide them with the opportunity to quickly reach more customers across regional and national boundaries, regardless of geographical spatiality and constraints by using their store networks and intra-store resources. Furthermore, a network of stores means that multichannel retailers or hybrid pure online traders are in a better position to react to customers' complaints and product returns by using the different stores to act as central points that facilitate the quick and prompt response to customers' needs. Lombart, Labbe-Pinlon, Filser, Anteblian, and Louis (2018) reveal how multichannel retails use regional product assortment to be responsive towards customers' preferences and for enhancing brand image.

Looked at differently, multichannel grocery retailers possess an advantage through their immobility in terms of both static and dynamic market changes that enable them to refine their grocery assortment and re-configure their business model to an in-store e-fulfillment (piggyback) or hybrid model in response to the ever-changing and greater sophisticated needs of their customers. For instance, Tesco started with piggyback and moved to hybrid, hence Sainsbury's started with hybrid and moved back to piggyback. The elements above are captured in the summary in Table 1 for each e-grocery model (pure online traders, multichannel traders) through key aspects of logistics or services such as customer density, returnability convenience for customers, and turnover volume requirements.

These impediments, taken together, make the duplication by competitors difficult. Of greater importance is the fact that stores contribute to provide a wider coverage to the population. In theory, it would be possible to buy a store in a specific location (an approach adopted by some pure online traders to create a hybrid model, as shown in the summary in Table 1); however, isolating mechanisms such as impediments to imitation and first-mover advantage are driving factors for resource immobility. Thus, the immobility of the store arises from its interconnectedness with the location and the value created. The interconnectedness deters competition where the physical space and handling requirements comprise significant costs that are difficult to recoup from delivery charges that are at levels acceptable to customers. Hence, another example of how e-grocery transforms the qualities of stores to serve as an impediment to imitation.

#### *4.2.3. Stores' resources in e-grocery creating non-substitutability*

Also, of interest in relation to the RBV criteria is the question of whether the resource is non-substitutable. This raises the question of whether there is another resource (e.g. technology, transport, etc.) that can replace the role of stores (physical infrastructure) in the supply and distribution of groceries to online customers. Even with complementary central distribution or e-fulfilment centres, the managers suggest that stores remain non-substitutable for e-grocery operations because of, among other considerations, their criticality, the cross-fertilisation and cross-pollination opportunities they offer, the flexibility offered by their decentralised nature, and low resource utilisation to respond to a sudden increase in online demand.

**Stores vs. Central distribution or dedicated e-fulfilment centres:** "They were fine, but the company was losing money, because it is more difficult to manage productivity in a central distribution or dedicated e-fulfilment centre than it is in the store. That's why they decided to get rid of it. They had to give out too many vouchers, stuff like that. They put the dot.com in the store and it's more profitable now".

**Criticality:** "because we would not be able to run dot.com without the store".

Cross-pollination and cross-fertilisation are higher in-store than in a central distribution or dedicated e-fulfilment centre. Pickers receive better product knowledge from in-store departmental experts. Equally, dot.com managers act proactively in the manner that supports not only the online, but the offline channel too:

**Cross-fertilisation in-store:** *"As a manager in the store, I've got other managers who used to work for home shopping that work in the store as well, in the cases where I am off, they understand the system and procedures. Also my knowledge of the store and my background of two years before I joined home shopping is important. I was a manager on ambient, grocery, and frozen products. I often talk to those managers who are overseeing ambient and frozen and make sure that inventory is filled up i.e. milk, beans."*

**Cross-pollination in-store:** *"If customers order a seabass fish, but not available from the counter; personal shopper may not have the product knowledge to pack a different alternative fish, hence a member of staff on the fish counter may have been able to assist on a similar product."*

The decentralised nature of stores allows for flexibility to counteract against sudden market forces from competitors, such as pure plays and other multichannel operators, whilst maintaining service levels and swiftly responding to customers' complaints across a wider geographical penetration at a lower cost than a central distribution or dedicated e-fulfilment centre, both in the short and long-term periods. The practitioners expressed different perspectives for the in-store and a central distribution or dedicated centre e-fulfilment:

**Responding to sudden uncertain online demand in store:** *"The reason we moved to 1-h slot is because a competitor did it, and the market research indicated that customer preferred the 1-h slot more. To provide the service is more expensive because to offer it within a narrow delivery time it means efficiency is impacted."*

**Central distribution or dedicated e-fulfilment centre's response to 1-h delivery:** *"It all works when you start to get more density, so you doing more deliveries in a more drop density. At the moment we cover a huge area of London. We don't want to start going to East London, and come back. At the moment, until we build our trade labels/levels up, it's not proving to be as cost-effective as it will be in the future."*

**Long-term adaptability:** *"I think the role of stores will change over time. Let say over the next ten years 10% of grocery retailing moves online. That means re-working the branch model to cope with that and think about what you do in terms of space created, what we are doing in dedicated mobile space is doing online grocery picking. I think all of the grocery retail thinks of this, you cope with the different blue prints of what you want our stores to do. At the moment it is a backbone".*

The resource utilisation is low in-store if compared to a central distribution or dedicated e-fulfilment centre, and a store has been instrumental in managing the uncertain peak demands with such low resources, whilst experimenting with the online channels. The average van utilisation and average staff composition imply that there is a lower consumption of resources in-store as opposed to a central distribution or dedicated e-fulfilment centre:

**In-store resource utilisation:** "*In the store, I have about 70 home shopping staffs and 6 vans. It's slightly different in that I have two vans that go out potentially four times a day, and four vans that potentially go out twice a day. We have a run that goes out at 7:45 and return at 10: am for 45 min and goes out again at 10:45 and again at 13:45, and lastly at 15:*45 that *four times a day. The other vans do double run from 8:30 to 8:45 and have 18 deliveries (separate drops we call then) to drop off and return around 3 or 3:30 in the afternoon and that's loaded again to go out at 4:30 or 16:45 and stay out until 10 pm.*"

**Central distribution or dedicated e-fulfilment centre resource utilisation:** *"We have around 60 vans, which we don't use them all every day, we do have picks on a Saturday. On average, almost like 45 routes maybe in a day, and that may pick on Saturdays, i.e. in the morning to 50 routes, and 20 in the evening. The average route is typically 10 orders, 3 miles per order. The furthest probably is at the region 60 miles, and shortest around 5 miles. There are probably 300 people working here, all reporting to various different managers."*

The quotes above serve as a clear indication that stores are one of the resources possessed by e-grocery retailers that probably cannot be conveyable across an assortment of technologies, products and markets.

The practice of using stores for order picking as part of the e-grocery supply chain, therefore, helps avoid early obsolescence of sites, whilst maintaining more off-line and multichannel choices for customers. The costs of acquiring or substituting stores pose a major challenge to grocery practitioners. Consequently, unless there are other resources (which are in themselves valuable, rare, inimitable and non-substitutable) able to replace the advantages associated with the store resources for the supply and distribution of e-groceries, it is reasonable to argue that the store resources, when used as part of the e-grocery operations, serve as a good example of how the qualities of tangible assets transform in e-commerce.

### 4.3. Appropriability of stores' resources in e-commerce

The findings highlight learning curves in terms of product development, availability management, and the ability to deal with an unpredictable environment, as some of the appropriability that arise from stores for the benefit of the e-grocery fulfilment channel. The emphasis is on the ability to turn the added value arising from stores into profit, through an understanding of online customers' trends and behaviour for customised marketing as explained below:

**Learning curves on product development:** *"it is an essential part of our business, it's about product development, and without both of them we would not get a true reflection on our customers. You get two completely of different customers and we can get data to measure them both and particular branch"*.

**Learning curves on managing availability**: *"The key to success online groceries is making sure that customers get exactly what they have ordered from the website. In order to be able to do that is making sure there are very good regular availability of products in the store, and low level of: out of stock, not available, or out of goods or required substitutes products. Mainly focusing on the supply chain, ensuring that availability is good when we need to pick online groceries. In some instances, that has influence the times which we do pick for online groceries from in stores, because we want to make sure that we picking from the best availability measure that we can"*.

**Learning curves on dealing with unpredictable environment:** *"I think for me as an individual, not working with things that are quite black and white, rather greys and ambiguous things and being involved in early decision making of how we might change things, has been really, really exciting and quite challenging. We want to get to a stage where it's predictable, we understand it, and we can operate and function efficiently with it, at the moment it is unpredictable. Some of those learning as we go through are really painful if you get it wrong i.e. lots of customers not getting what they have ordered, missing goods, late deliveries, all of those things can be really painful.*

Another important element of appropriability appears to be the lead time in terms of the cost associated with setting up the new infrastructure necessary for the supply and distribution of e-groceries, as opposed to having the existing infrastructure for dual purposes, as explained below:

**Lead time on cost cutting:** "*I guess you do not have to build a separate store. You have got resource already in the store; you got shelves already full of stock, so I would imagine from the cost point of view it's much more effective to operate in the store than in a separate centre"*.

Furthermore, stores have enabled e-grocery retailers to capture the market first which is a critical determinant of the length of the pioneer's monopoly position. The longer the entrant is the only actor, the longer it can build up and benefit from the head start it achieved by entering early in terms of customers' trust, assortment, and service delivery, as explained below:

**First-mover advantage:** "*We have nearly half of the market because of the first mover advantage, pleased with the performance and growth. Any new entrant is evident of competition. But the important thing is how do customers respond, and what happens to market share over the period of time. The very interesting thing is that we look at what competitors are able to offer customers. Especially how close they can provide a full home shopping service. E.g. selected from about 25 000 different products that is normally offered in a normal UK food store. We are allowing in having the widest range and widest coverage across the country of that offer. Therefore, customers have a clear choice, if they want to shop online if they shopping for themselves then we are a very natural choice. But if they want to buy large quantities of one or two products then there are alternatives. Also look at not only the price of the products, but the price of delivery charge as well"*.

Additionally, the appropriability of stores is observed from the varied productivity levels. The average order picking is surprisingly high in-store, as opposed to a central distribution or dedicated e-fulfilment centre. A closer observation reveals that this is due to the technological integration in some of the operators, hence those with high integrated legacy in-store systems manage better. Whilst the technological gap can be easily closed and is highly imitable, the learning curve appears to be high in-store and provides in-store with a head-start advantage:

**In-store pick rates:** *Company A- "The average shopping basket for online shoppers is 60 products, picked at about 110-120 products per hour and delivered at a rate of 2.7 deliveries per hour." Company B – "We pick at 140 per hour and the average online basket spending is 70 pounds and pick to 90 pounds during Christmas periods*."

**Central distribution or dedicated e-fulfilment centre pick rates**: "*People pick at 200 an hour, but on average is 100 items per hour."*

A deeper observation into the different pick rates appears to be related to IT capabilities.

**In-store picking process: "***we have our own computer system/picking control system; which gives us all the orders and puts the orders into team pads for them to collect. We also have separate page which gives us availability. The scan tells the picker where to pick the product."*

**Central distribution or dedicated e-fulfilment centre picking process**: "*we start from pickets, and people start from block, then shelf, then a price. It's such a manual thing which reduces picking efficiency. The average online basket is 87.16 pounds."*

The latter provides practical case evidence of an unquestionable enduring competitive advantage not only in the efficient utilisation of in-store IT systems and investment, but also in reducing costs. The difference in technologies gives the in-store model a head-start in order processing, commercialisation (lead time), and learning curves, whilst leaving a central distribution or dedicated e-fulfilment centre model in the unenviable position of playing 'catch-up'. An important observation by previous scholars (Delerue & Lejeune, 2010; Keupp, Beckenbauer, & Gassmann, 2010), is that lead time moves firms towards the continuum of sustainable competitive advantage. Moreover, even though the IT systems used by the in-store model are imitable, some scholars (Fahy, 2000; Tokuda, 2005), suggest that inimitability exists due to economic deterrents such as, in this case, the IT system transaction cost barrier.

It is clear that most of the benefits put forward by the practitioners are those that add value towards appropriability. For example, product development to reflect both offline and online customers and data collection points to measure both types of customers. Of greater importance, are product development and the ability to cope with market changes, which give the e-grocery retailers lead time and first-mover advantages, and the means to capture the returns related to the exploitation of opportunities.

## 5. Discussion

The evidence from the managers sheds additional light on how the role played by resources changes across different business contexts, and how the RBV is evolving in the digital era. The evolvement leads to numerous implications for theory, practice, and transportation.

### 5.1. Implication for theory

Firstly, while a tangible resource may not meet the RBV criteria towards SCA for offline channels in the grocery sector, the same resource meets RBV criteria towards SCA for online channels. The findings offer a better understanding of which and when particular resources translate

into a sustainable competitive advantage in online versus offline channels for multichannel retailers. This implies that while the stores (tangible resources) may not necessarily be a source of a sustainable competitive advantage for grocery retailers' offline channel, it may be a source of competitive advantage for their online channel.

Secondly, while a resource may not meet the RBV criteria towards SCA for some businesses in the same channel (e.g. online distribution of books and music by Amazon), the same resource may meet the RBV criteria towards SCA for other online channels (e.g. e-grocery retailing, due to the nature of the products). Although there is a vast amount of literature on resources for SCA (Akter et al., 2016; Amit & Han, 2017; Barney, 2018; Shan et al., 2018), there is little research on the evidence of the conditions under which tangible resources yield a sustainable competitive advantage.

Lastly, the findings reveal how the top e-grocery retailers organise their store resources to efficiently distribute e-groceries and achieve maximum utilisation in the digital era. This provides a context that complements the 'O' organisational aspects of the VRIO framework discussed by Barney (2008).

### 5.2. Implication for practice

This study offers e-grocery practitioners a different avenue of reflection with regards to how to kill two birds with one stone. The digital transformation of tangible resources provides interesting ideas of resource orchestration, cross-fertilisation of knowledge, and cross-utilisation of human resources in a context where the physical space and handling requirements comprise significant costs that are difficult to recoup from delivery charges that are at levels acceptable to customers. Most importantly, it highlights how digitalisation helps to gain traction into virtual markets, whilst deterring competition through the use of complementary offline tangible infrastructure. The use of stores as part of the e-grocery operations, not only maintains an off-line multichannel for customers, but also has implications towards avoiding early obsolescence of the stores' sites and city logistics in this increasing era of e-shopping and digitalisation.

### 5.3. Implication for transportation

Although not explicitly pronounced, a deeper observation of the findings reveals that this study has implications in city logistics and transportation as it affects the last mile of e-grocery deliveries. Due to the perishable nature of the items, as well as the order delivery size and frequency involved, retailers venture into online grocery by leveraging their network of stores to gain a greater geographical penetration, while offering tactical competitive value propositions to their customers through delivery-window time slots and a variance in delivery tariffs, more so than delivery methods. This has some double-edged effects with implications in transportation and environment. On the one hand, the stores' position closer to customers reduces the distance travelled from store to homes, costs and mileage over a central distribution or dedicated e-fulfilment centre, which is used by both pure or multiple-channel online traders. However, the larger the network of stores, the more outbound trips are required, resulting in the growing number of freight vehicles in cities. This contributes to congestion, noise pollution, and the increase of land-use demand. On the other hand, intense competition in offering competitive delivery slots implies more trips and more van assets for deliveries that has several implications in terms of the number of cars on the road, transportation or delivery van maintenance, potential congestion, efficiency and environmental delivery compliance, etc.

From an environmental perspective, e-grocery operators are subject to $CO_2$ emission reporting and compliance, which requires the e-grocery operators to explore different green delivery methods. This has managerial (and policy) implications. The commitment and responsibility to the environment creates value through brand enhancement less the cost of building the brand, of marketing, and of the charges associated with non-compliance; whilst creating reputational barriers and learning curves over competitors. According to Hooley, Saunders, Piercy, and Nicoulaud (2008), brands are difficult to build. Yet, they add value to and build customer retention, whilst creating defensible, competitive positions. Based on this view, it is fair to conclude that the best management practices in reducing carbon emission during the delivery of online groceries, can translate into the enhancement of the brand, customers' retention, and defensible competitive positions by the e-grocers.

## 6. Conclusion

The purpose of this paper was to provide empirical evidence related to whether operating an e-grocery channel by leveraging the existing network of stores can yield a sustainable competitive advantage and how this can be achieved. In order to address the research questions that were formulated, a multi-case study was carried out and that involved a sample of retailers that are deemed to be leaders in the UK e-grocery market. The resource-based view (RBV) model provided the theoretical foundations for this work in terms of assessing and justifying the qualification of tangible resources (stores) to the RBV criteria.

The findings offer interesting insights into some of the RBV's missing puzzle pieces with regards to tangible resources' ability to create SCA. The use of tangible resources in creating value, barriers, and appropriability deepens our current understanding of the changing role of resources, and how the RBV continues to evolve in the digital era. Our findings indicate that e-grocery retailers with a greater geographical penetration of stores can venture into online grocery retail, and expand their market share because of the various tangible and intangible benefits that are enacted when leveraging the network of existing stores.

This work has limitations that impact the generalisability of our findings. The study has focused in the UK e-grocery market. The order fulfilment and last mile delivery operations and constraints in the UK may not necessarily be valid to customers and retailers in other countries. Nevertheless, given the significant importance and position of the retailers involved in this study, the empirical evidence that was found provides adequate insights and reflection for the UK market. In addition, the paper did not take into account the effects of the e-grocery retailers' size on the perceived tangible and intangible benefits that are enabled by leveraging the physical network of stores.

Future research can pursue several avenues that could potentially extend the findings and address the limitations of this study. For instance, gathering the actual costs and benefits data necessary to justify value in quantitative economic terms proved to be problematic for this study due to the commercial sensitiveness and perceived threats from competitors. Future studies could pursue this avenue, which will not only provide the quantifiable value, but also reduce some of the limitations in measuring value that are associated with the RBV, as previously acknowledged by various scholars (Kraaijenbrink, Spender, & Groen, 2010; Priem & Butler, 2001; Tokuda, 2005).

Another extension of this study could also explore how digitalisation transforms the qualities of other tangible resources in multichannel retailing or in another virtual context. We can also expand our study by considering cases from other countries and/or the differential size between the e-grocery retailers that will be involved in the study.

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